

SIMILKAMEEN
STRATEGIC ENVIRONMENTAL PLAN
SYNOPSIS

Planning and Assessment Branch
and
Okanagan Sub-Region
Ministry of Environment
February 1986

SIMILKAMEEN STRATEGIC ENVIRONMENTAL PLAN: SYNOPSIS

INTRODUCTION

The Ministry of Environment's sub-regional plans are designed to assist resource managers to maintain a quality environment by assessing the current status of environmental resources, and identifying management tasks to be undertaken over the next five years. The general approach is to identify present and potential resource supplies, and present and potential uses of these resources, then set management objectives and activities which will serve to alleviate imbalances between supply and use, within realistic budget constraints. Specific tasks that have to be undertaken over the next few years are outlined in this Synopsis and will be prioritized by the Ministry for future budgeting and implementation. The basic analysis is contained in the Similkameen Technical Report, and summarized in the Summary Plan. This Synopsis is a distillation of the major management strategies.

DESCRIPTION OF UNIT

The Similkameen planning unit includes all of the Similkameen River drainage system in British Columbia except the headwaters in Manning Provincial Park (Figure 1). It covers an area of approximately 7200 km² and contains a diversity of biogeoclimatic zones ranging from subalpine coniferous areas in the cooler moister western parts of the unit, to Ponderosa pine - bunchgrass associations in the more arid southeast. In the Princeton area, the economy is dominated by forestry, mining and cattle ranching, with the Keremeos area the focal point of a fruit-growing industry. The current population of the Similkameen unit is approximately 8800.

WATER QUANTITY MANAGEMENT

Water management objectives for the Similkameen area are:

1. Provide water supplies for licensed full-season irrigation uses four out of every five years on average.
2. Reduce the potential for loss of life and property damage caused by flooding and erosion.
3. Ensure adequate low flows for instream uses, primarily fisheries and waste dilution, where economic and social benefits are justified.
4. Maintain flows in the Similkameen River at the Canada - U.S. border to meet established obligations for water supply in the State of Washington.



FIGURE 1
SIMILKAMEEN PLANNING UNIT

In terms of the first objective (water supply), the surface waters of the entire basin are committed to licensed users, except for small domestic and short-term irrigation uses from April 1 to July 31. In three sub-basins, Upper Otter and Keremeos Creeks and the Lower Similkameen River (excluding upstream input), licensed quantities if fully used could not be met four years in five on average. However, irrigation users in the Keremeos Creek and Lower Similkameen River sub-basins utilize groundwater instead of or in conjunction with licensed surface waters to meet their irrigation requirements. Thus, the water management objectives for licensed uses are in fact being realized throughout the basin.

Throughout the whole Similkameen watershed, 82% of licensed water use is for irrigation. However, this amount represents only 26% of potential irrigation use should all privately-held ALR land become irrigated. During the next 5 years, only a 9% increase in water requirements is projected for the Lower Similkameen sub-basin, or approximately a 6% increase over current planning unit requirements. Some of this water is available under short-term licences, but late summer irrigation water cannot be licensed from surface sources.

In the longer term, additional water supplies to meet future irrigation requirements may be available through the construction of additional storage, or through increased use of groundwater. Storage of the spring freshet, the first option, currently captures about 0.6% of the total runoff from the planning unit. A number of technically suitable storage sites remain to be developed, should economic and other feasibility studies indicate their suitability. These include additional potential in Nickel Plate, Davis, Missezula, Chain and Otter Lakes, and as yet undeveloped Siwash, Teepee, Lorne, Issitz and Wolfe Lakes. The Ashnola River has also been suggested as additional storage, but no engineering studies have investigated this area. At present, 12,500 cubic decametres (10,130 acre-feet) of storage have been developed in the entire plan area, and an approximately equivalent amount of additional storage is considered to be technically feasible, not including the Ashnola River. Considerably less storage development is thought practical due to high development costs and private land holdings.

The second option for providing increased water supply is through expanded use of groundwater. Of the more than 550 wells in the planning unit, over 200 are capable of producing yields sufficiently large for irrigation purposes (3 L/s or more). Approximately two-thirds of the high yield wells are in the Keremeos - Cawston area. Groundwater licensing is included in the Water Act, but clauses pertaining to groundwater have not been implemented/proclaimed. Therefore, groundwater use is unregulated and the degree of use is unknown due to a lack of metered volumetric data from these wells. However, analysis indicates that the apparently greatly increased use of this water source over the last 2-3 decades has not adversely affected surface flows in the Similkameen River. Due to the minimal development cost, future increases in the demand for irrigation water will likely be met to at least some extent from available groundwater sources, provided minimum surface flows are not affected and potential well interferences, as a result of pumping, are not significant.

SIMILKAMEEN PLANNING UNIT

- 1 Upper Otter Creek
-Thalia Upstream
- 2 Summers Creek
- 3 Lower Otter Creek
-Otter Lake to Thalia
- 4 Allison Creek
- 5 Hayes Creek
- 6 Tulameen River
- 7 Wolfe Creek
- 8 Upper Similkameen River
-Hedley Upstream
- 9 Keremeos Creek
- 10 Lower Similkameen River
-Hedley to International
Boundary

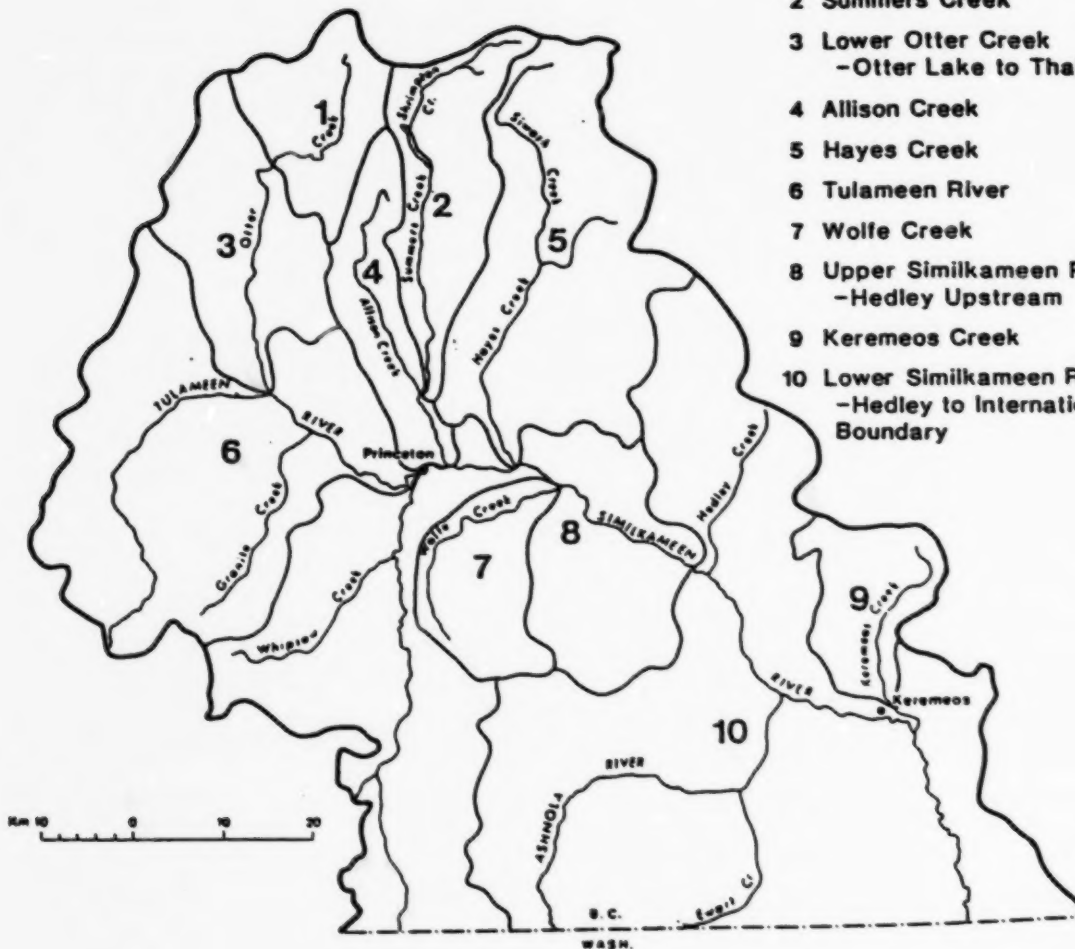


Figure 2
SUB-BASINS FOR WATER QUANTITY ANALYSIS

In furtherance of the second water management objective, dykes have been constructed along the Tulameen and Similkameen Rivers near Princeton and in the Keremeos-Cawston areas to provide a measure of flood protection. However, downstream from the Keremeos-Cawston area to the International Boundary, there is a great need for additional dyking, both on Indian lands and elsewhere. Existing floodplain mapping for the Tulameen River in the vicinity of Coalmont and Tulameen indicates that these communities are subject to flooding. Ice-jamming created potential flooding problems in 1983-84 in the vicinity of Princeton. Floodplain management policies will be applied to minimize future flood damages by appropriate input into land-use planning and by stipulating floodproofing conditions pursuant to legislation. More detailed topographic information and flood profile studies are required in order to update the existing preliminary floodplain mapping of the Similkameen River. Other priority areas not yet mapped should be identified for future mapping projects.

The third objective with respect to instream flow requirements is not being achieved throughout the basin. Low flows in some creeks limit fish production. However, the amount of water and the reaches where flows are considered important for sport fish have yet to be determined precisely by the Fisheries Program. This evaluation is a joint management activity to be carried out by both the Fisheries and Water Management programs.

The fourth objective, to provide adequate transboundary flows, is being met through a Water Management Branch policy in place since 1949 that no additional water will be diverted from the Similkameen River system except through storage of freshet water during the months of May and June, and release as required to satisfy the requirements of senior downstream licensees (both Canadian and American).

Water management priorities over the next five years include activities designed to improve information on present and future uses of water, and to evaluate additional storage opportunities should the need arise in the future.

1. Institute, when available, the developing computerized system for rapid retrieval of water licence and stream feature information, to accelerate licence application processing.
2. Carry out a field investigation to differentiate between surface and groundwater use by irrigators.
3. Using Keremeos Irrigation District pumping records, compare the actual rate of monthly and seasonal water use with estimated requirements over a period of years of varying climatic conditions, to assess the accuracy of the current estimation methods and refine projections of future use.
4. In water-short areas, determine water consumption by major irrigation licence holders, through use of a questionnaire.

5. In cooperation with the Ministry of Agriculture and Food, determine the extent and probable phasing of increased water demand by the appropriate Improvement Districts.
6. Identify locations and install one or more stream gauges in small watersheds in the middle Similkameen where data gaps make water supply difficult to estimate, and refine yield information from existing gauges by determining actual water use upstream of the gauges.
7. With respect to groundwater:
 - determine gradients of the groundwater aquifer in the Keremeos - Cawston area
 - determine a better estimate of late summer withdrawals through inventory of groundwater well flow rates and frequency of use
 - carry out limited water quality sampling, including testing for recommended residual, water-soluble pesticides.
8. Identify sources of funds to augment Nickel Plate Lake storage, which is already licensed for development.
9. Determine the economic and environmental feasibility of providing additional storage for other potential storage sites.
10. Provide one metre contour mapping and carry out flood profile studies for the Similkameen River from U.S. border to Princeton to update the existing preliminary floodplain mapping for the area. Identify and request mapping of other priority floodplain areas.

WATER QUALITY MANAGEMENT

One of the Ministry's objectives is to maintain ambient water quality at levels which protect designated water uses through controlling waste discharge and monitoring water quality. Water quality management objectives for the Similkameen during the 5-year term of this plan are:

1. To ensure that provisional water quality objectives for the parameters and designated water uses established by the Ministry and summarized in Table 1 are achieved.
2. To maintain existing water quality in those areas of the planning unit where provisional objectives have not been proposed in this plan.
3. To continue current waste management efforts to discourage direct discharge to the Similkameen River or its tributaries.

Water quality in the planning unit was analyzed in seven sub-basins (Figure 3), delineated on the basis of discrete watersheds, and the locations of effluent discharges and ambient water quality monitoring stations. In general, water quality in the Similkameen River and its tributaries meets provisional water quality objectives proposed in this plan. For the provisional water quality objectives proposed in Table 1, monitoring is recommended in the Summary Plan to sample ambient water quality as one step to finalize these objectives.

SIMILKAMEEN PLANNING UNIT

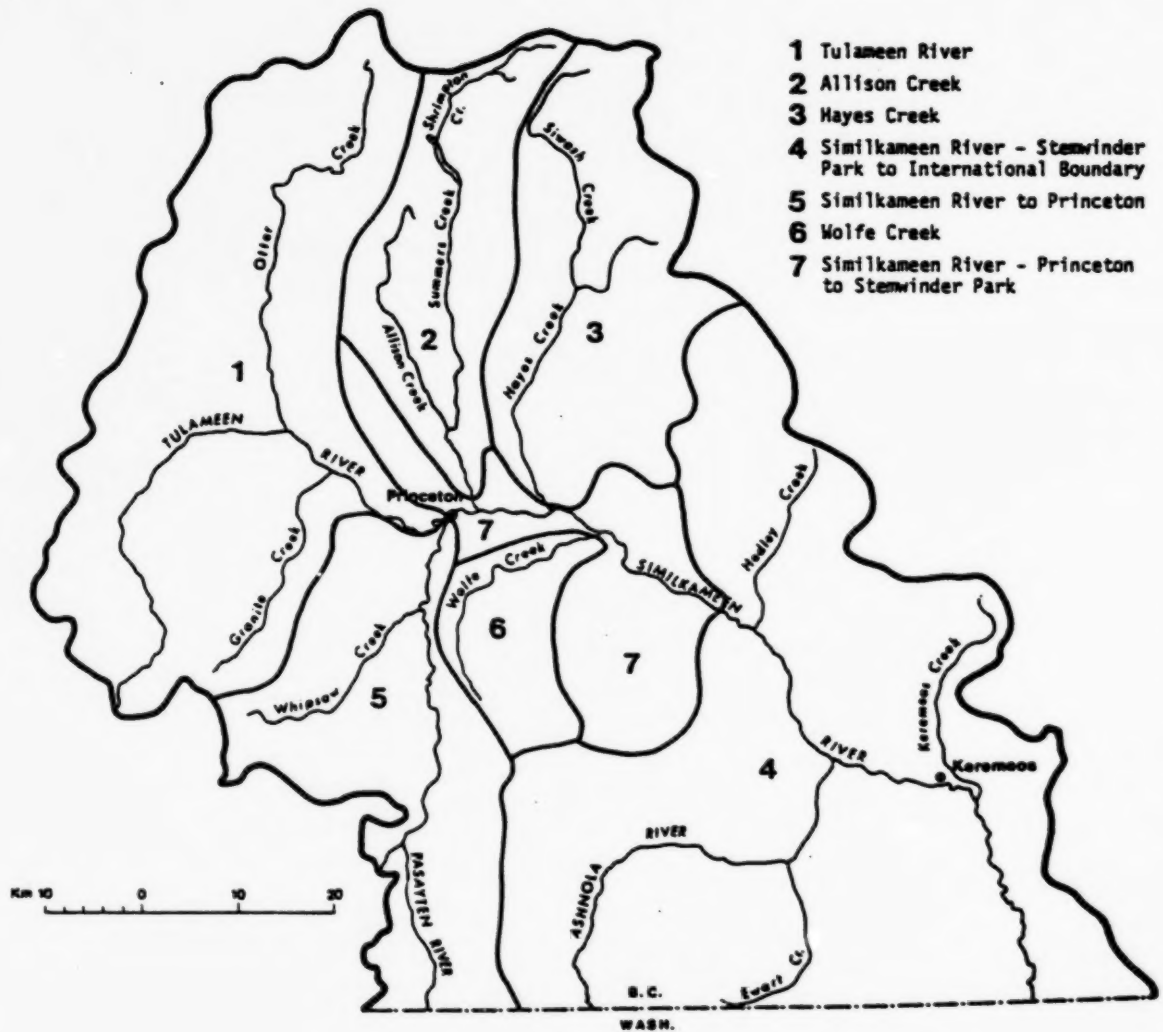


Figure 3
WATER QUALITY SUB-BASINS

TABLE 1
PROVISIONAL WATER QUALITY OBJECTIVES AND DESIGNATED WATER USES
FOR SIMILKAMEEN SUB-BASINS

SUB-BASIN	PROVISIONAL OBJECTIVES ¹	DESIGNATED WATER USES				
		Domestic Supply	Irrigation & Livestock	Recreation	Aquatic Life & Wildlife	Industrial
Similkameen - upstream of Princeton	Copper, zinc, fecal coliforms	X	X	X	X	X
Tulameen River	-	X	X	X	X	
Allison Creek	Phosphorus ² , fecal coliforms, dissolved oxygen	X	X	X	X	
Hayes Creek	Phosphorus ³	X	X	X	X	
Wolfe Creek	pH, molybdenum, manganese, copper, iron, zinc, dissolved solids	X ⁴	X		X	X
Similkameen - Princeton to Stenwinder	pH, fecal coliforms, ammonia, chlorine residual	X	X	X	X	X
Similkameen - Stenwinder to International Boundary	pH, fecal coliforms, ammonia, chlorine residual	X	X	X	X	X

¹ See Table 15 of the Summary Plan and/or Similkameen River Sub-basin Water Quality Assessment and Objectives (Water Management Branch, November, 1985) for quantitative values of provisional objective parameters.

² Allison and Missetzula Lakes only.

³ Osprey Lake only.

⁴ Livestock watering only.

Zinc concentrations increase between Manning Park and Princeton. Further monitoring is recommended to determine the extent of upstream natural sources of mineralization in relation to any contribution of seepage from the west dam of Newmont Mines.

The Tulameen River sub-basin is of low to moderate priority for water quality management although priority could be changed should the proposed Cyprus Anvil coal mine near Coalmont proceed. This would be subject to review under the Coal Development Guidelines process. Low priority monitoring is recommended to determine ambient levels of selected parameters, and issue-specific monitoring should be considered when logging plans are finalized for the upper Tulameen. No provisional water quality objectives are proposed for this sub-basin, since there are currently no developments which threaten designated water uses.

In the Allison Creek sub-basin, Allison Lake is becoming eutrophic due to high nutrient loadings resulting from development along the shoreline, and upstream nutrient loadings possibly from cattle wastes. Both Allison and Missezula lakes are sensitive to increased nutrient loadings. To protect water quality, additional monitoring and measures to control nutrient loadings in this watershed are proposed.

Chain, Link and Osprey lakes in the Hayes Creek sub-basin are also becoming increasingly eutrophied. This is due to release of phosphorus from lake bottom sediments, along with nutrient contributions related to shoreline development. Hayes Creek discharge from the three lakes is seasonally subject to elevated nutrient loadings which may derive from cattle wastes, and site-specific monitoring is proposed to address these concerns.

In Wolfe Creek, the concentrations of several parameters have been elevated downstream from the east dam of Newmont Mines tailings pond, but the distance these remain at high levels is not known. Provisional water quality objectives have been developed for a number of these parameters, and monitoring is recommended at three locations.

In the section of the Similkameen River between Princeton and Stenwinder Provincial Park, the Princeton Sewage Treatment Plant and the Weyerhaeuser Canada Ltd. industrial landfill are the two permitted discharges in the area. Neither operation was determined to be having any adverse effect on the river's water quality. Water quality monitoring near these locations is thus a low priority.

Downstream from Stenwinder Park to the International Boundary, the only problem identified was in Keremeos Creek, where elevated nutrient and fecal coliform levels are believed to be due principally to cattle wastes and/or septic tanks. Site-specific monitoring is proposed for Keremeos Creek, with continued monitoring recommended at several other locations related to effluent permits.

In summary, water quality in the Similkameen River is high. It is, however, recognized that the river and its tributaries have limited capacity for receiving contaminants without negatively impacting on existing water quality. Accordingly, it is necessary to continue with current waste

management efforts to discourage direct discharge, and to encourage waste recycling and other modern waste management techniques.

Proposed management activities, taking into account budget constraints and other priorities, include:

1. Determine and quantify source of contaminants in the vicinity of the west dam of Smelter Lake, and extent of the effects downstream from the east dam, and work with Newmont Mines to rectify any problems attributable to their operations.
2. Determine and quantify sources of nutrients in Allison, Hayes and Keremeos Creeks, and meet with appropriate agencies to alleviate these problems.
3. Carry out a recommended water quality monitoring program at 25 locations specified in the Summary Plan, to:
 - provide ambient water quality information in the areas where provisional objectives exist,
 - provide background information in other areas,
 - address concerns outlined above, including lakeshore development in Allison and Hayes sub-basins, and appropriate follow-up.

FISHERIES MANAGEMENT

The general Fisheries Management program objectives that are applicable to the Similkameen area are:

1. To provide populations of sport fish in sufficient numbers to meet current and future angler demands with an average success rate of not less than 1.6 fish per angler day, with the fish averaging 25 cm in length. The fishery will be intensively managed for a variety of catch success and fish length.
2. To provide a diversity of recreational experiences by distributing angling effort across the unit's lakes and streams among all sport fish species.

The Similkameen unit fishery supports approximately 155,000 angler days per year, and an estimated catch of 240,000 fish. The fishery is based upon 84 small, productive lakes which are heavily stocked with trout, receive 85% of angler effort, and produce 90% of angler catch in the unit. However, the success rate for anglers is 1.6 fish caught per angler day in lakes, below the Provincial and Regional objective of 2 fish/day, and only 1.2 fish/day in rivers and streams. Since angling activity is forecast to increase 25% by 1990, the success rate will decline further below the objective in the absence of stocks. Therefore, management activities need to be designed to produce more fish to take account of the increased angler pressure, and to increase the catch success rate.

Since most angling now occurs in the small lakes, a habitat type reasonably well understood for fisheries management, analysis concentrated on improving production in the lakes. Four stocking-based options were suggested, using 1982 stocking requirements and catch success as the base year (see Figure 4).

Option 1 - Discontinue stocking. Since only natural reproduction would continue, at a rate assumed to hold constant over the period to 1990, success rates of 1.6 fish/angler day in 1982 would decline rapidly at first and slowly thereafter, eventually reaching 0.7 by 1990. It is likely that at such a low success rate, angling activity would decline significantly. Stocking costs of this option would of course be nil.

Option 2 - Maintain 1982 stocking rate. Continuing the 1982 stocking program of 123,000 fingerlings and 217,000 yearlings would also result in a declining success rate over time, but at a much slower rate than in Option 1. By 1990, success would have dropped from 1.6 fish/angler day in 1982 to 1.3 fish. Stocking costs would remain essentially constant at just under \$50,000 (\$1983).

Option 3 - Increase stocking to maintain 1982 success rate. Since the objective of this option is to hold the success rate constant, it would remain at 1.6 fish/angler day through to 1990. However, the increasing target harvest to meet increased angler use would result in steadily climbing stocking costs, reaching \$61,500 (\$1983) by 1990, when stocking would be 24.2% higher than in 1982.

Option 4 - Increase stocking to meet a success rate of 2.0 in 1990. This objective could be achieved by increasing stocking gradually during the period from 1982 (when success was 1.6) to 1990, when the objective of 2.0 would be met. Stocking costs would increase to \$77,000 (\$1983) and involve the release of 191,000 fingerlings and 337,000 yearlings by 1990.

Clearly options 1 and 2 would not achieve the management objective set for the Similkameen unit. There is some uncertainty as to whether the sustainable harvest in the basin's lakes is adequate to permit an annual catch of over 250,000 fish as suggested for options 3 and 4. Substantial experimental work is required to determine maximum sustainable stocking rates for a number of lakes and gradually to increase the stocking program towards this level.

The rivers and streams of the basin attract some 23,000 angling days for a harvest of approximately 28,000 fish. The main management activities are to protect and improve habitats and to regulate the fishery to control over-exploitation of stocks.

Specific management activities proposed to increase fisheries productivity, management information, or angler success by 1990 include:

1. Increase stocking rates as feasible, to help maintain the catch success objective in lakes of 1.6 fish per angler day by 1990.
2. Undertake fisheries inventory and creel census to provide necessary information for intensive management through regulation and stocking. These activities have been identified as a priority for 12 and 6 lakes respectively.
3. Carry out construction and other management activities identified as a priority for 17 lakes, including aeration, fish barriers, lake restoration, outlet improvement, boat launch provisions, etc., to improve productivity and use of the fishery.

Similkameen Planning Unit

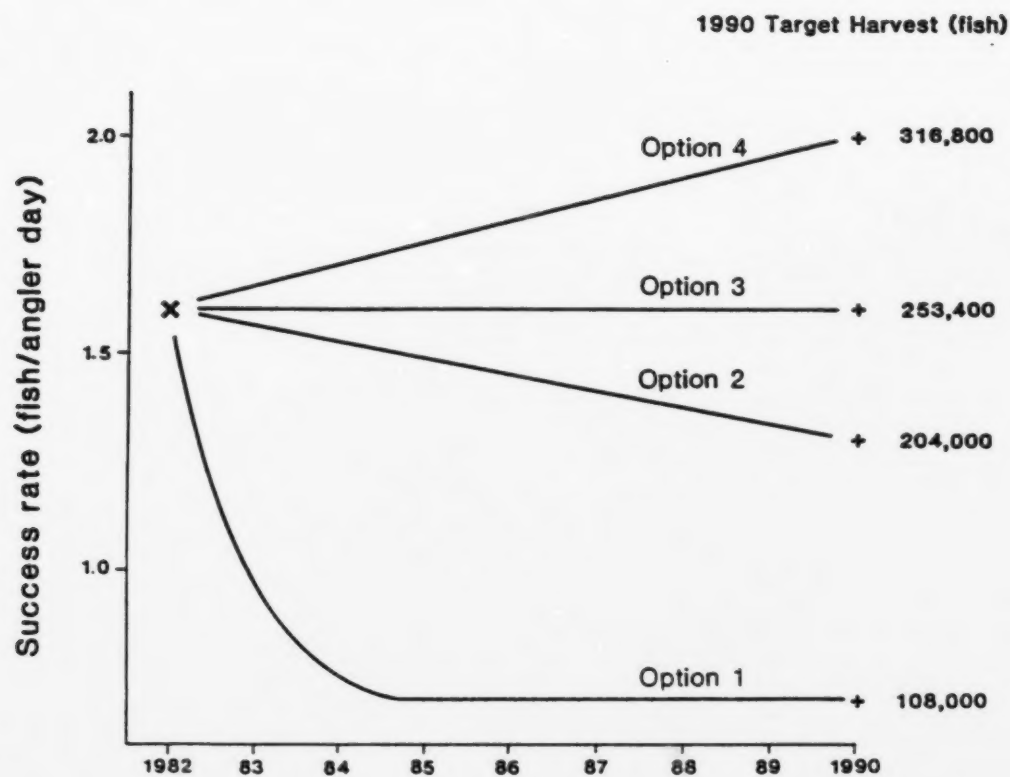


Figure 4
FISHERIES MANAGEMENT STOCKING OPTIONS

4. Encourage angling effort in lakes currently little used, to broaden the distribution of angling effort across the basin, for example through the forest referral process as it affects logging access road location.
5. Review, and revise if necessary, river and stream angling regulations to protect declining stocks.
6. Identify priority fishery streams where low water flows impair productivity, and estimate minimum flows required for fisheries use.
7. Cooperate in feasibility assessment of steelhead introduction from Washington.
8. Protect existing and potential fish habitats through the referral process (e.g. CRMPs, 5-year Development Plans, TSA Plans, Official Settlement Plans) to meet fish production targets.

WILDLIFE MANAGEMENT

In the Similkameen, wildlife management has mainly concentrated on the species of big-game which are hunted, and therefore on the availability of sufficient numbers of the priority species (deer, moose, elk, bighorn sheep and mountain goat) to satisfy that component of demand. Non-consumptive recreational enjoyment of some of these species (particularly bighorn sheep and mountain goat) has increased in popularity in the Similkameen recently, with species and habitat management providing animals for both consumptive and non-consumptive purposes. The maintenance of diversity of other wildlife species will continue to be achieved through protection of the diverse habitats occurring in this planning unit.

During 1980-82, the average annual number of resident hunting days was nearly 24,000, of which 80% were spent hunting deer, with moose and elk much lower at 10% and 6% respectively. Populations of bighorn sheep and mountain goats, although highly valued by trophy hunters, are small and available for hunting only through Limited Entry Hunt permits.

Average annual harvests are shown in Table 2, along with 1990 harvest objectives based mainly on projected human population increases, which maintain or, in the case of elk, improve the effort/harvest index for the various species. Effort per harvest indices show that moose and particularly elk require relatively more hunting effort per harvest than the Provincial average. Availability of suitable habitat is critical for all species, and to a large extent is related to the activities of the forest and agriculture industries.

TABLE 2
BIG GAME HARVESTS AND HARVEST OBJECTIVES IN THE SIMILKAMEEN

SPECIES	AVERAGE 1980-82 HARVEST	1990 HARVEST OBJECTIVE	INCREASE BY 1990
Deer	772	889	117
Black Bear	72	83	11
Moose	55	55	0
Elk	10	17	7
Mountain Goat	8	9	1
Bighorn Sheep	8	9	1
Cougar	2	2	0

Proposed management activities to meet the projected harvest objectives for 1990 include:

1. Deer - identify high capability winter ranges currently under-utilized by deer, and use appropriate enhancement activities to increase population sizes by 1000 deer. Enhancement techniques include thinning and prescribed logging, underburning of logged areas, planting and reseeding of shrubs favoured by deer, and protection of mature forest which provides thermal cover, and grasslands for forage. Reduce poaching and road kills. Consider a limited antlerless deer season.
2. Moose - inventory populations, determine factors limiting recruitment, establish population density objectives, and reduce allowable harvest in the short term until population sizes and timing factors are understood. Enhance suitable areas north of Princeton through prescribed burning, and selective logging.
3. Elk - develop a harvest management strategy for elk, and consider intensive enhancement of winter range in the Princeton area.
4. Bighorn Sheep - continue enhancement activities in the Ashnola area, develop a continuing inventory strategy, determine factors limiting recruitment, mitigate forage competition conflicts with cattle, acquire winter range, and continue the Limited Entry Hunt with harvest and regulations changes.
5. Mountain Goats - maintain LEH restrictions, while protecting existing winter range, continuing population inventory, and considering transplants to suitable but vacant goat ranges.
6. Habitat - protect existing and potential wildlife habitats through the referral processes to meet wildlife goals and objectives.

AIR QUALITY MANAGEMENT

Smoke emissions in the Princeton area, mainly from the Weyerhaeuser operation, constitute the only air quality problem in the planning unit. Dustfall levels downwind from the mill have been higher than the proposed Provincial ambient air quality criteria in the past, but have decreased recently as equipment has been upgraded. In the absence of any meteorological monitoring station in the area, extrapolations from other areas indicate poor dispersion potential for air pollutants in the valley around Princeton, especially in fall and winter. The overall conclusion drawn from the dispersion potential concern in the Princeton area is that applications for permits for significant air emissions should be assessed using dispersion models.

The proposed management activities are:

1. Install a Provincial Air Pollution Surveillance station in the Princeton area to provide ambient air quality data on suspended particulates, dustfall and sulphation.
2. Manage air emissions to meet ambient air quality criteria.

SUMMARY

The main conclusions concerning management strategies for environmental resources in the Similkameen planning unit are as follows:

1. Several headwater lakes have been identified for potential storage to meet future irrigation demand. Economic feasibility of developing storage is the major constraint.
2. Potential appears to exist for groundwater development to provide increases for water users in specific areas at reasonable costs. Further exploration and development is required to ascertain the degree of this potential.
3. Water quality generally meets objectives to protect desired uses with the exception of a number of small creeks and recreational lakes where nutrient loadings are of some concern.
4. The capability of both air and water to assimilate wastes is very limited. It is therefore necessary to continue with current waste management efforts to discourage direct discharges to surface waters, in favour of ground disposal, and to encourage waste recycle and other modern waste management techniques.
5. There remains the capability to increase populations of fish and wildlife to meet recreational demands, although in the case of fish this appears limited. The level of management will be constrained by monies available and priorities elsewhere in the Region and Province.
7. The implementation of the management activities proposed in this plan are subject to availability of fiscal and staff resources.